SUBJECT INDEX

Aggregates

Automatic Image Analysis in Evaluation of Aggregate Shape, Jerzy M. Brzezicki and Janusz Kasperkiewicz, CP Apr. 99, p123-128.

Internal Structure Characterization of Asphalt Concrete Using Image Analysis, E. Masad, B. Muhunthan, N. Shashidhar and T. Harman, CP Apr. 99, p88-95.

Air injection

Digital Image Analysis to Assess Microbubble Behavior in Porous Media, S. E. Burns and M. Zhang, CP Jan. 99, p43-48.

Algorithms

Algorithm for Estimating Length of Bent Objects, Edmond W. Holroyd, III, CP Apr. 99, p130-134.

Constraint-Based Support for Collaboration in Design and Construction, Claudio Lottaz, Denis E. Clément, Boi V. Faltings and Ian F. C. Smith, CP Jan. 99, p23-35.

Novel Approach to Pavement Cracking Detection Based on Fuzzy Set Theory, H. D. Cheng, Jim-Rong Chen, Chris Glazier and Y. G. Hu, CP Oct. 99, p270-280.

Analysis

Design and Implementation of Versatile Beam Analyzer, S. T. Mau and X. Tao, CP Jan. 99, p50-52.

Animation

Building Design Services in a Distributed Architecture, Charles S. Han, John C. Kunz and Kincho H. Law, CP Jan. 99, p12-22.

Aquifer characteristics

Subsurface Characterization Using Artificial Neural Network and GIS, Subhrendu Gangopadhyay, Tirtha Raj Gautam and Ashim Das Gupta, CP July 99, p153-161.

Aquifers

Subsurface Characterization Using Artificial Neural Network and GIS, Subhrendu Gangopadhyay, Tirtha Raj Gautam and Ashim Das Gupta, CP July 99, p153-161.

Artificial intelligence

Analysis of Masonry Panel under Biaxial Bending Using ANNs and CBR, A. Mathew, B. Kumar, B. P. Sinha and R. F. Pedreschi, CP July 99, p170-177.

Asphaltic concrete

Internal Structure Characterization of Asphalt Concrete Using Image Analysis, E. Masad, B. Muhunthan, N. Shashidhar and T. Harman, CP Apr. 99, p88-95.

Attenuation

Multicriteria DSS with Historical Database for Attenuator Selection, Lisa K. Spainhour, Primus V. Mtenga, P.E. and John Sobanjo, P.E., CP July 99, p187-197.

Automation

Automatic Image Analysis in Evaluation of Aggregate Shape, Jerzy M. Brzezicki and Janusz Kasperkiewicz, CP Apr. 99, p123-128.

Building Design Services in a Distributed Architecture, Charles S. Han, John C. Kunz and Kincho H. Law, CP Jan. 99, p12-22.

Novel Approach to Pavement Cracking Detection Based on Fuzzy Set Theory, H. D. Cheng, Jim-Rong Chen, Chris Glazier and Y. G. Hu, CP Oct. 99, p270-280.

Banding

Sand Shear Band Thickness Measurements by Digital Imaging Techniques, Khalid A. Alshibli and Stein Sture, CP Apr. 99, p103-109.

Beams

Design and Implementation of Versatile Beam Analyzer, S. T. Mau and X. Tao, CP Jan. 99, p50-52.

Bed load movement

Computer Vision Technique for Tracking Bed Load Movement, Athanasios N. Papanicolaou, Panayiotis Diplas, Mahesh Balakrishnan and Clinton L. Dancey, CP Apr. 99, p71-79.

Bench marks

Benchmarking the World Wide Web in Student Collaboration, Paul S. Chinowsky, CP Oct. 99, p254-260.

Bending

Algorithm for Estimating Length of Bent Objects, Edmond W. Holroyd, III, CP Apr. 99, p130-134.

Biaxial bending

Analysis of Masonry Panel under Biaxial Bending Using ANNs and CBR, A. Mathew, B. Kumar, B. P. Sinha and R. F. Pedreschi, CP July 99, p170-177.

Bonding

Quantitative Image Analysis of Masonry Mortar Microstructure, A. M. Werner and D. A. Lange, P.E., CP Apr. 99, p110-115.

Brick masonry

Quantitative Image Analysis of Masonry Mortar Microstructure, A. M. Werner and D. A. Lange, P.E., CP Apr. 99, p110-115.

Bridge design

Sequence-Based Prediction in Conceptual Design of Bridges, Weiyuan Wang and John S. Gero, CP Jan. 97, p37-43.

Bubbles

Digital Image Analysis to Assess Microbubble Behavior in Porous Media, S. E. Burns and M. Zhang, CP Jan. 99, p43-48.

Building design

Building Design Services in a Distributed Architecture, Charles S. Han, John C. Kunz and Kincho H. Law, CP Jan. 99, p12-22.

Case reports

Applications and Issues of GIS as Tool for Civil Engineering Modeling, Scott B. Miles and Carlton L. Ho, CP July 99, p144-152.

Comparison of Case-Based Reasoning and Artificial Neural Networks, David Arditi and Onur Behzat Tokdemir, CP July 99, p162-169.

Information Technology Planning Framework for Large-Scale Projects, Feniosky Peña-Mora, Sanjeev Vadhavkar, Eric Perkins and Thomas Weber, CP Oct. 99, p226-237.

Collisions

Multicriteria DSS with Historical Database for Attenuator Selection, Lisa K. Spainhour, Primus V. Mtenga, P.E. and John Sobanjo, P.E., CP July 99, p187-197.

Communication systems

Benchmarking the World Wide Web in Student Collaboration, Paul S. Chinowsky, CP Oct. 99, p254-260.

Compaction

Internal Structure Characterization of Asphalt Concrete Using Image Analysis, E. Masad, B. Muhunthan, N. Shashidhar and T. Harman, CP Apr. 99, p88-95.

Computer aided design

Building Design Services in a Distributed Architecture, Charles S. Han, John C. Kunz and Kincho H. Law, CP Jan. 99, p12-22.

MS_CMAC Neural Network Learning Model in Structural Engineering, Shih-Lin Hung and J. C. Jan, CP Jan. 99, p1-11.

Computer analysis

Algorithm for Estimating Length of Bent Objects, Edmond W. Holroyd, III, CP Apr. 99, p130-134.

Internal Structure Characterization of Asphalt Concrete Using Image Analysis, E. Masad, B. Muhunthan, N. Shashidhar and T. Harman, CP Apr. 99, p88-95.

Computer applications

Applications and Issues of GIS as Tool for Civil Engineering Modeling, Scott B. Miles and Carlton L. Ho, CP July 99, p144-152.

Design of High-Performance Concrete Mixture Using Neural Networks and Nonlinear Programming, I-Cheng Yeh, CP Jan. 99, p36-42.

Developing Complex Integrated Computer Applications and Systems, Brian L. Smith and William T. Scherer, CP Oct. 99, p238-245.

Planning for Computer Integrated Construction, Youngsoo Jung and G. Edward Gibson, Jr., CP Oct. 99, p217-225.

Robust Water System Design with Commercial Intelligent Search Optimizers, Istvan Lippai, James P. Heaney and Manuel Laguna, CP July 99, p135-143.

Computer models

Modeling and Analysis of a Concrete Production Plant Using Petri Nets, Anil Sawhney, Osama Abudayyeh and Tavatchai Chaitavatputtiporn, CP July 99, p178-186.

Computer networks

A/E/C Teamwork: A Collaborative Design and Learning Space, Renate Fruchter, CP Oct. 99, p261-269.

Benchmarking the World Wide Web in Student Collaboration, Paul S. Chinowsky, CP Oct. 99, p254-260.

Building Design Services in a Distributed Architecture, Charles S. Han, John C. Kunz and Kincho H. Law, CP Jan. 99, p12-22.

Frameworks for Interaction Support in Distributed Learning Environments, Karim M. Hussein and Feniosky Peña-Mora, CP Oct. 99, p291-302.

Computer programs

Design and Implementation of Versatile Beam Analyzer, S. T. Mau and X. Tao, CP Jan. 99, p50-52.

Computer software

Developing Complex Integrated Computer Applications and Systems, Brian L. Smith and William T. Scherer, CP Oct. 99, p238-245.

Frameworks for Interaction Support in Distributed Learning Environments, Karim M. Hussein and Feniosky Peña-Mora, CP Oct. 99, p291-302.

Constraints

Constraint-Based Support for Collaboration in Design and Construction, Claudio Lottaz, Denis E. Clément, Boi V. Faltings and Ian F. C. Smith, CP Jan. 99, p23-35.

Construction

Comparison of Case-Based Reasoning and Artificial Neural Networks, David Arditi and Onur Behzat Tokdemir, CP July 99, p162-169.

Constraint-Based Support for Collaboration in Design and Construction, Claudio Lottaz, Denis E. Clément, Boi V. Faltings and Ian F. C. Smith, CP Jan. 99, p23-35.

Fuzzy Optimal Model for Resource-Constrained Construction Scheduling, Sou-Sen Leu, An-Ting Chen and Chung-Huei Yang, CP July 99, p207-216.

Modeling and Analysis of a Concrete Production Plant Using Petri Nets, Anil Sawhney, Osama Abudayyeh and Tavatchai Chaitavatputtiporn, CP July 99, p178-186.

Planning for Computer Integrated Construction, Youngsoo Jung and G. Edward Gibson, Jr., CP Oct. 99, p217-225.

Construction management

EvoSite: Evolution-Based Model for Site Layout Planning, Tarek Hegazy and Emad Elbeltagi, CP July 99, p198-206.

Contamination

Magnetic Resonance Imaging of Hydrocarbon-Contaminated Porous Media, Mesut Pervizpour, Sibel Pamukcu and Horace Moo-Young, CP Apr. 99, p96-102.

Cracks

Novel Approach to Pavement Cracking Detection Based on Fuzzy Set Theory, H. D. Cheng, Jim-Rong Chen, Chris Glazier and Y. G. Hu, CP Oct. 99, p270-280.

Curricula

A/E/C Teamwork: A Collaborative Design and Learning Space, Renate Fruchter, CP Oct. 99, p261-269.

Database management systems

Multicriteria DSS with Historical Database for Attenuator Selection, Lisa K. Spainhour, Primus V. Mtenga, P.E. and John Sobanjo, P.E., CP July 99, p187-197.

Decision making

Comparison of Case-Based Reasoning and Artificial Neural Networks, David Arditi and Onur Behzat Tokdemir, CP July 99, p162-169.

Constraint-Based Support for Collaboration in Design and Construction, Claudio Lottaz, Denis E. Clément, Boi V. Faltings and Ian F. C. Smith, CP Jan. 99, p23-35.

Modeling and Analysis of a Concrete Production Plant Using Petri Nets, Anil Sawhney, Osama Abudayyeh and Tavatchai Chaitavatputtiporn, CP July 99, p178-186.

Decision support systems

Multicriteria DSS with Historical Database for Attenuator Selection, Lisa K. Spainhour, Primus V. Mtenga, P.E. and John Sobanjo, P.E., CP July 99, p187-197.

Sequence-Based Prediction in Conceptual Design of Bridges, Weiyuan Wang and John S. Gero, CP Jan. 97, p37-43.

Deformation

Interferometric Imaging: Involvement in Civil Engineering, P. Jacquot and M. Facchini, CP Apr. 99, p61-70.

Sand Shear Band Thickness Measurements by Digital Imaging Techniques, Khalid A. Alshibli and Stein Sture, CP Apr. 99, p103-109.

Design

Constraint-Based Support for Collaboration in Design and Construction, Claudio Lottaz, Denis E. Clément, Boi V. Faltings and Ian F. C. Smith, CP Jan. 99, p23-35.

Sequence-Based Prediction in Conceptual Design of Bridges, Weiyuan Wang and John S. Gero, CP Jan. 97, p37-43.

Digital techniques

Digital Image Analysis to Assess Microbubble Behavior in Porous Media, S. E. Burns and M. Zhang, CP Jan. 99, p43-48.

Sand Shear Band Thickness Measurements by Digital Imaging Techniques, Khalid A. Alshibli and Stein Sture, CP Apr. 99, p103-109.

Soil Particle Size Distribution by Mosaic Imaging and Watershed Analysis, Ali M. Ghalib and Roman D. Hryciw, CP Apr. 99, p80-87.

Discharge

Hysteresis Sensitive Neural Network for Modeling Rating Curves, Maha Tawfik, Ayman Ibrahim and Hussam Fahmy, CP July 97, p206-211.

Displacement

Measurement of Particle Movement in Granular Soils Using Image Analysis, Murat Guler, Tuncer B. Edil and Peter J. Bosscher, CP Apr. 99, p116-122.

Distribution functions

Frameworks for Interaction Support in Distributed Learning Environments, Karim M. Hussein and Feniosky Peña-Mora, CP Oct. 99, p291-302.

Engineering education

Benchmarking the World Wide Web in Student Collaboration, Paul S. Chinowsky, CP Oct. 99, p254-260.

Entrainment

Computer Vision Technique for Tracking Bed Load Movement, Athanasios N. Papanicolaou, Panayiotis Diplas, Mahesh Balakrishnan and Clinton L. Dancey, CP Apr. 99, p71-79.

Equipment

Multicriteria DSS with Historical Database for Attenuator Selection, Lisa K. Spainhour, Primus V. Mtenga, P.E. and John Sobanjo, P.E., CP July 99, p187-197.

Evolutionary computation

Evolution Program for Layout Geometry of Rectilinear Looped Networks, J. W. Davidson, CP Oct. 99, p246-253.

EvoSite: Evolution-Based Model for Site Layout Planning, Tarek Hegazy and Emad Elbeltagi, CP July 99, p198-206.

Fuzzy Optimal Model for Resource-Constrained Construction Scheduling, Sou-Sen Leu, An-Ting Chen and Chung-Huei Yang, CP July 99, p207-216.

Robust Water System Design with Commercial Intelligent Search Optimizers, Istvan Lippai, James P. Heaney and Manuel Laguna, CP July 99, p135-143.

Fuzzy sets

Fuzzy Optimal Model for Resource-Constrained Construction Scheduling, Sou-Sen Leu, An-Ting Chen and Chung-Huei Yang, CP July 99, p207-216.

Novel Approach to Pavement Cracking Detection Based on Fuzzy Set Theory, H. D. Cheng, Jim-Rong Chen, Chris Glazier and Y. G. Hu, CP Oct. 99, p270-280.

Geographic information systems

Applications and Issues of GIS as Tool for Civil Engineering Modeling, Scott B. Miles and Carlton L. Ho, CP July 99, p144-152.

Subsurface Characterization Using Artificial Neural Network and GIS, Subhrendu Gangopadhyay, Tirtha Raj Gautam and Ashim Das Gupta, CP July 99, p153-161.

Geology

Subsurface Characterization Using Artificial Neural Network and GIS, Subhrendu Gangopadhyay, Tirtha Raj Gautam and Ashim Das Gupta, CP July 99, p153-161.

Grain size

Sand Shear Band Thickness Measurements by Digital Imaging Techniques, Khalid A. Alshibli and Stein Sture, CP Apr. 99, p103-109.

Grain size analysis

Automatic Image Analysis in Evaluation of Aggregate Shape, Jerzy M. Brzezicki and Janusz Kasperkiewicz, CP Apr. 99, p123-128.

Soil Particle Size Distribution by Mosaic Imaging and Watershed Analysis, Ali M. Ghalib and Roman D. Hryciw, CP Apr. 99, p80-87.

Granular media

Measurement of Particle Movement in Granular Soils Using Image Analysis, Murat Guler, Tuncer B. Edil and Peter J. Bosscher, CP Apr. 99, p116-122.

Graphic methods

Modeling and Analysis of a Concrete Production Plant Using Petri Nets, Anil Sawhney, Osama Abudayyeh and Tavatchai Chaitavatputtiporn, CP July 99, p178-186.

Graphical analysis

Design and Implementation of Versatile Beam Analyzer, S. T. Mau and X. Tao, CP Jan. 99, p50-52.

Ground-water flow

Subsurface Characterization Using Artificial Neural Network and GIS, Subhrendu Gangopadhyay, Tirtha Raj Gautam and Ashim Das Gupta, CP July 99, p153-161.

Heuristics

Robust Water System Design with Commercial Intelligent Search Optimizers, Istvan Lippai, James P. Heaney and Manuel Laguna, CP July 99, p135-143.

High strength concretes

Design of High-Performance Concrete Mixture Using Neural Networks and Nonlinear Programming, I-Cheng Yeh, CP Jan. 99, p36-42.

Holography

Interferometric Imaging: Involvement in Civil Engineering, P. Jacquot and M. Facchini, CP Apr. 99, p61-70.

Hydrocarbons

Magnetic Resonance Imaging of Hydrocarbon-Contaminated Porous Media, Mesut Pervizpour, Sibel Pamukcu and Horace Moo-Young, CP Apr. 99, p96-102.

Hysteresis

Hysteresis Sensitive Neural Network for Modeling Rating Curves, Maha Tawfik, Ayman Ibrahim and Hussam Fahmy, CP July 97, p206-211.

Image analysis

Algorithm for Estimating Length of Bent Objects, Edmond W. Holroyd, III, CP Apr. 99, p130-134.

Automatic Image Analysis in Evaluation of Aggregate Shape, Jerzy M. Brzezicki and Janusz Kasperkiewicz, CP Apr. 99, p123-128.

Computer Vision Technique for Tracking Bed Load Movement, Athanasios N. Papanicolaou, Panayiotis Diplas, Mahesh Balakrishnan and Clinton L. Dancey, CP Apr. 99, p71-79.

Digital Image Analysis to Assess Microbubble Behavior in Porous Media, S. E. Burns and M. Zhang, CP Jan. 99, p43-48.

Imaging Technologies: New Tools for Civil Engineers, J. David Frost, CP Apr. 99, p59-60.

Internal Structure Characterization of Asphalt Concrete Using Image Analysis, E. Masad, B. Muhunthan, N. Shashidhar and T. Harman, CP Apr. 99, p88-95.

Measurement of Particle Movement in Granular Soils Using Image Analysis, Murat Guler, Tuncer B. Edil and Peter J. Bosscher, CP Apr. 99, p116-122.

Novel Approach to Pavement Cracking Detection Based on Fuzzy Set Theory, H. D. Cheng, Jim-Rong Chen, Chris Glazier and Y. G. Hu, CP Oct. 99, p270-280.

Quantitative Image Analysis of Masonry Mortar Microstructure, A. M. Werner and D. A. Lange, P.E., CP Apr. 99, p110-115.

Sand Shear Band Thickness Measurements by Digital Imaging Techniques, Khalid A. Alshibli and Stein Sture, CP Apr. 99, p103-109.

Soil Particle Size Distribution by Mosaic Imaging and Watershed Analysis, Ali M. Ghalib and Roman D. Hryciw, CP Apr. 99, p80-87.

Imaging techniques

Imaging Technologies: New Tools for Civil Engineers, J. David Frost, CP Apr. 99, p59-60.

Interferometric Imaging: Involvement in Civil Engineering, P. Jacquot and M. Facchini, CP Apr. 99, p61-70.

Incipient motion

Computer Vision Technique for Tracking Bed Load Movement, Athanasios N. Papanicolaou, Panayiotis Diplas, Mahesh Balakrishnan and Clinton L. Dancey, CP Apr. 99, p71-79.

Information systems

A/E/C Teamwork: A Collaborative Design and Learning Space, Renate Fruchter, CP Oct. 99, p261-269.

Information Technology Planning Framework for Large-Scale Projects, Feniosky Peña-Mora, Sanjeev Vadhavkar, Eric Perkins and Thomas Weber, CP Oct. 99, p226-237.

Planning for Computer Integrated Construction, Youngsoo Jung and G. Edward Gibson, Jr., CP Oct. 99, p217-225.

Infrastructure

Imaging Technologies: New Tools for Civil Engineers, J. David Frost, CP Apr. 99, p59-60.

Instruction

Impact of Multimedia-Based Instruction on Learning and Retention, Raja R. A. Issa, Cox. Robert F. and Clifford F. Killingsworth, CP Oct. 99, p281-290.

Integrated systems

Developing Complex Integrated Computer Applications and Systems, Brian L. Smith and William T. Scherer, CP Oct. 99, p238-245.

Planning for Computer Integrated Construction, Youngsoo Jung and G. Edward Gibson, Jr., CP Oct. 99, p217-225.

Intelligent transportation systems

Developing Complex Integrated Computer Applications and Systems, Brian L. Smith and William T. Scherer, CP Oct. 99, p238-245.

Interactive systems

Frameworks for Interaction Support in Distributed Learning Environments, Karim M. Hussein and Feniosky Peña-Mora, CP Oct. 99, p291-302.

Interferometry

Interferometric Imaging: Involvement in Civil Engineering, P. Jacquot and M. Facchini, CP Apr. 99, p61-70.

Investment return analysis

Information Technology Planning Framework for Large-Scale Projects, Feniosky Peña-Mora, Sanjeev Vadhavkar, Eric Perkins and Thomas Weber, CP Oct. 99, p226-237.

Knowledge-based systems

Sequence-Based Prediction in Conceptual Design of Bridges, Weiyuan Wang and John S. Gero, CP Jan. 97, p37-43.

Laboratory tests

Computer Vision Technique for Tracking Bed Load Movement, Athanasios N. Papanicolaou, Panayiotis Diplas, Mahesh Balakrishnan and Clinton L. Dancey, CP Apr. 99, p71-79.

Lasers

Interferometric Imaging: Involvement in Civil Engineering, P. Jacquot and M. Facchini, CP Apr. 99, p61-70.

Layout

Evolution Program for Layout Geometry of Rectilinear Looped Networks, J. W. Davidson, CP Oct. 99, p246-253.

EvoSite: Evolution-Based Model for Site Layout Planning, Tarek Hegazy and Emad Elbeltagi, CP July 99, p198-206.

Learning systems

A/E/C Teamwork: A Collaborative Design and Learning Space, Renate Fruchter, CP Oct. 99, p261-269.

Frameworks for Interaction Support in Distributed Learning Environments, Karim M. Hussein and Feniosky Peña-Mora, CP Oct. 99, p291-302.

Impact of Multimedia-Based Instruction on Learning and Retention, Raja R. A. Issa, Cox. Robert F. and Clifford F. Killingsworth, CP Oct. 99, p281-290.

Length

Algorithm for Estimating Length of Bent Objects, Edmond W. Holroyd, III, CP Apr. 99, p130-134.

Litigation

Comparison of Case-Based Reasoning and Artificial Neural Networks, David Arditi and Onur Behzat Tokdemir, CP July 99, p162-169.

Magnetic resonance imaging (MRI)
Magnetic Resonance Imaging of Hydrocarbon-Contaminated Porous Media, Mesut Pervizpour, Sibel Pamukcu and Horace Moo-Young, CP Apr. 99, p96-102.

Management planning
Planning for Computer Integrated Construction, Youngsoo Jung and G. Edward Gibson, Jr., CP Oct. 99, p217-225.

Masonry
Analysis of Masonry Panel under Biaxial Bending Using ANNs and CBR, A. Mathew, B. Kumar, B. P. Sinha and R. F. Pedreschi, CP July 99, p170-177.

Measurement
Algorithm for Estimating Length of Bent Objects, Edmond W. Holroyd, III, CP Apr. 99, p130-134.
Impact of Multimedia-Based Instruction on Learning and Retention, Raja R. A. Issa, Cox. Robert F. and Clifford F. Killingsworth, CP Oct. 99, p281-290.
Interferometric Imaging: Involvement in Civil Engineering, P. Jacquot and M. Facchini, CP Apr. 99, p61-70.

Microstructure
Quantitative Image Analysis of Masonry Mortar Microstructure, A. M. Werner and D. A. Lange, P.E., CP Apr. 99, p110-115.

Mixtures
Design of High-Performance Concrete Mixture Using Neural Networks and Nonlinear Programming, I-Cheng Yeh, CP Jan. 99, p36-42.

Modeling
Applications and Issues of GIS as Tool for Civil Engineering Modeling, Scott B. Miles and Carlton L. Ho, CP July 99, p144-152.
Hysteresis Sensitive Neural Network for Modeling Rating Curves, Maha Tawfik, Ayman Ibrahim and Hussam Fahmy, CP July 97, p206-211.
Subsurface Characterization Using Artificial Neural Network and GIS, Subhrendu Gangopadhyay, Tirtha Raj Gautam and Ashim Das Gupta, CP July 99, p153-161.

Mortars
Quantitative Image Analysis of Masonry Mortar Microstructure, A. M. Werner and D. A. Lange, P.E., CP Apr. 99, p110-115.

Multimedia
Impact of Multimedia-Based Instruction on Learning and Retention, Raja R. A. Issa, Cox. Robert F. and Clifford F. Killingsworth, CP Oct. 99, p281-290.

Negotiations
Constraint-Based Support for Collaboration in Design and Construction, Claudio Lottaz, Denis E. Clément, Boi V. Faltings and Ian F. C. Smith, CP Jan. 99, p23-35.

Network geometry
Evolution Program for Layout Geometry of Rectilinear Looped Networks, J. W. Davidson, CP Oct. 99, p246-253.

Neural networks
Analysis of Masonry Panel under Biaxial Bending Using ANNs and CBR, A. Mathew, B. Kumar, B. P. Sinha and R. F. Pedreschi, CP July 99, p170-177.
Comparison of Case-Based Reasoning and Artificial Neural Networks, David Arditi and Onur Behzat Tokdemir, CP July 99, p162-169.
Design of High-Performance Concrete Mixture Using Neural Networks and Nonlinear Programming, I-Cheng Yeh, CP Jan. 99, p36-42.
Hysteresis Sensitive Neural Network for Modeling Rating Curves, Maha Tawfik, Ayman Ibrahim and Hussam Fahmy, CP July 97, p206-211.
MS_CMAC Neural Network Learning Model in Structural Engineering, Shih-Lin Hung and J. C. Jan, CP Jan. 99, p1-11.
Subsurface Characterization Using Artificial Neural Network and GIS, Subhrendu Gangopadhyay, Tirtha Raj Gautam and Ashim Das Gupta, CP July 99, p153-161.

Nile River
Hysteresis Sensitive Neural Network for Modeling Rating Curves, Maha Tawfik, Ayman Ibrahim and Hussam Fahmy, CP July 97, p206-211.

Nonlinear programming
Design of High-Performance Concrete Mixture Using Neural Networks and Nonlinear Programming, I-Cheng Yeh, CP Jan. 99, p36-42.

Object-oriented languages
Design and Implementation of Versatile Beam Analyzer, S. T. Mau and X. Tao, CP Jan. 99, p50-52.

Optimization
Design of High-Performance Concrete Mixture Using Neural Networks and Nonlinear Programming, I-Cheng Yeh, CP Jan. 99, p36-42.
Evolution Program for Layout Geometry of Rectilinear Looped Networks, J. W. Davidson, CP Oct. 99, p246-253.
EvoSite: Evolution-Based Model for Site Layout Planning, Tarek Hegazy and Emad Elbeltagi, CP July 99, p198-206.
Robust Water System Design with Commercial Intelligent Search Optimizers, Istvan Lippai, James P. Heaney and Manuel Laguna, CP July 99, p135-143.

Optimization models
Fuzzy Optimal Model for Resource-Constrained Construction Scheduling, Sou-Sen Leu, An-Ting Chen and Chung-Huei Yang, CP July 99, p207-216.

Orientation
Internal Structure Characterization of Asphalt Concrete Using Image Analysis, E. Masad, B. Muhunthan, N. Shashidhar and T. Harman, CP Apr. 99, p88-95.

Panels
Analysis of Masonry Panel under Biaxial Bending Using ANNs and CBR, A. Mathew, B. Kumar, B. P. Sinha and R. F. Pedreschi, CP July 99, p170-177.

Particle motion
Measurement of Particle Movement in Granular Soils Using Image Analysis, Murat Guler, Tuncer B. Edil and Peter J. Bosscher, CP Apr. 99, p116-122.

Particle size distribution
Soil Particle Size Distribution by Mosaic Imaging and Watershed Analysis, Ali M. Ghalib and Roman D. Hryciw, CP Apr. 99, p80-87.

Pavement condition
Novel Approach to Pavement Cracking Detection Based on Fuzzy Set Theory, H. D. Cheng, Jim-Rong Chen, Chris Glazier and Y. G. Hu, CP Oct. 99, p270-280.

Plane strain
Sand Shear Band Thickness Measurements by Digital Imaging Techniques, Khalid A. Alshibli and Stein Sture, CP Apr. 99, p103-109.

Porous media
Digital Image Analysis to Assess Microbubble Behavior in Porous Media, S. E. Burns and M. Zhang, CP Jan. 99, p43-48.
Magnetic Resonance Imaging of Hydrocarbon-Contaminated Porous Media, Mesut Pervizpour, Sibel Pamukcu and Horace Moo-Young, CP Apr. 99, p96-102.

Predictions
Sequence-Based Prediction in Conceptual Design of Bridges, Weiyuan Wang and John S. Gero, CP Jan. 97, p37-43.

Process control
Modeling and Analysis of a Concrete Production Plant Using Petri Nets, Anil Sawhney, Osama Abudayyeh and Tavatchai Chaitavatputtiporn, CP July 99, p178-186.

Professional personnel
A/E/C Teamwork: A Collaborative Design and Learning Space, Renate Fruchter, CP Oct. 99, p261-269.

Quantitative analysis
Quantitative Image Analysis of Masonry Mortar Microstructure, A. M. Werner and D. A. Lange, P.E., CP Apr. 99, p110-115.

Remedial action
Digital Image Analysis to Assess Microbubble Behavior in Porous Media, S. E. Burns and M. Zhang, CP Jan. 99, p43-48.

Resource allocation
Fuzzy Optimal Model for Resource-Constrained Construction Scheduling, Sou-Sen Leu, An-Ting Chen and Chung-Huei Yang, CP July 99, p207-216.

Robust design
Robust Water System Design with Commercial Intelligent Search Optimizers, Istvan Lippai, James P. Heaney and Manuel Laguna, CP July 99, p135-143.

Safety education
Impact of Multimedia-Based Instruction on Learning and Retention, Raja R. A. Issa, Cox. Robert F. and Clifford F. Killingsworth, CP Oct. 99, p281-290.

Scheduling
Fuzzy Optimal Model for Resource-Constrained Construction Scheduling, Sou-Sen Leu, An-Ting Chen and Chung-Huei Yang, CP July 99, p207-216.

Sediment
Computer Vision Technique for Tracking Bed Load Movement, Athanasios N. Papanicolaou, Panayiotis Diplas, Mahesh Balakrishnan and Clinton L. Dancey, CP Apr. 99, p71-79.

Selection
Multicriteria DSS with Historical Database for Attenuator Selection, Lisa K. Spainhour, Primus V. Mtenga, P.E. and John Sobanjo, P.E., CP July 99, p187-197.

Shape
Interferometric Imaging: Involvement in Civil Engineering, P. Jacquot and M. Facchini, CP Apr. 99, p61-70.

Shear
Sand Shear Band Thickness Measurements by Digital Imaging Techniques, Khalid A. Alshibli and Stein Sture, CP Apr. 99, p103-109.

Shear tests
Measurement of Particle Movement in Granular Soils Using Image Analysis, Murat Guler, Tuncer B. Edil and Peter J. Bosscher, CP Apr. 99, p116-122.

Site preparation, construction
EvoSite: Evolution-Based Model for Site Layout Planning, Tarek Hegazy and Emad Elbeltagi, CP July 99, p198-206.

Soil classification
Soil Particle Size Distribution by Mosaic Imaging and Watershed Analysis, Ali M. Ghalib and Roman D. Hryciw, CP Apr. 99, p80-87.

Soil-structure interaction
Measurement of Particle Movement in Granular Soils Using Image Analysis, Murat Guler, Tuncer B. Edil and Peter J. Bosscher, CP Apr. 99, p116-122.

Steel structures
MS_CMAC Neural Network Learning Model in Structural Engineering, Shih-Lin Hung and J. C. Jan, CP Jan. 99, p1-11.

Strain
Interferometric Imaging: Involvement in Civil Engineering, P. Jacquot and M. Facchini, CP Apr. 99, p61-70.

Strategic planning
Information Technology Planning Framework for Large-Scale Projects, Feniosky Peña-Mora, Sanjeev Vadhavkar, Eric Perkins and Thomas Weber, CP Oct. 99, p226-237.
Planning for Computer Integrated Construction, Youngsoo Jung and G. Edward Gibson, Jr., CP Oct. 99, p217-225.

Stream gaging
Hysteresis Sensitive Neural Network for Modeling Rating Curves, Maha Tawfik, Ayman Ibrahim and Hussam Fahmy, CP July 97, p206-211.

Structural design
MS_CMAC Neural Network Learning Model in Structural Engineering, Shih-Lin Hung and J. C. Jan, CP Jan. 99, p1-11.

Students
A/E/C Teamwork: A Collaborative Design and Learning Space, Renate Fruchter, CP Oct. 99, p261-269.
Benchmarking the World Wide Web in Student Collaboration, Paul S. Chinowsky, CP Oct. 99, p254-260.

Subsurface investigations
Magnetic Resonance Imaging of Hydrocarbon-Contaminated Porous Media, Mesut Pervizpour, Sibel Pamukcu and Horace Moo-Young, CP Apr. 99, p96-102.

Surface-active agents
Digital Image Analysis to Assess Microbubble Behavior in Porous Media, S. E. Burns and M. Zhang, CP Jan. 99, p43-48.

Systems engineering
Developing Complex Integrated Computer Applications and Systems, Brian L. Smith and William T. Scherer, CP Oct. 99, p238-245.

Teaching methods

Impact of Multimedia-Based Instruction on Learning and Retention, Raja R. A. Issa, Cox. Robert F. and Clifford F. Killingsworth, CP Oct. 99, p281-290.

Teamwork

A/E/C Teamwork: A Collaborative Design and Learning Space, Renate Fruchter, CP Oct. 99, p261-269.

Benchmarking the World Wide Web in Student Collaboration, Paul S. Chinowsky, CP Oct. 99, p254-260.

Constraint-Based Support for Collaboration in Design and Construction, Claudio Lottaz, Denis E. Clément, Boi V. Faltings and Ian F. C. Smith, CP Jan. 99, p23-35.

Technology

Imaging Technologies: New Tools for Civil Engineers, J. David Frost, CP Apr. 99, p59-60.

Information Technology Planning Framework for Large-Scale Projects, Feniosky Peña-Mora, Sanjeev Vadhavkar, Eric Perkins and Thomas Weber, CP Oct. 99, p226-237.

Temporary structures

EvoSite: Evolution-Based Model for Site Layout Planning, Tarek Hegazy and Emad Elbeltagi, CP July 99, p198-206.

Turbulent flow

Computer Vision Technique for Tracking Bed Load Movement, Athanasios N. Papanicolaou, Panayiotis Diplas, Mahesh Balakrishnan and Clinton L. Dancey, CP Apr. 99, p71-79.

Voids

Internal Structure Characterization of Asphalt Concrete Using Image Analysis, E. Masad, B. Muhunthan, N. Shashidhar and T. Harman, CP Apr. 99, p88-95.

Volatile organic chemicals

Digital Image Analysis to Assess Microbubble Behavior in Porous Media, S. E. Burns and M. Zhang, CP Jan. 99, p43-48.

Water distribution

Evolution Program for Layout Geometry of Rectilinear Looped Networks, J. W. Davidson, CP Oct. 99, p246-253.

Robust Water System Design with Commercial Intelligent Search Optimizers, Istvan Lippai, James P. Heaney and Manuel Laguna, CP July 99, p135-143.

AUTHOR INDEX

Abudayyeh, Osama
see Sawhney, Anil, CP July 99, p178-186

Alshibli, Khalid A.
Sand Shear Band Thickness Measurements by Digital Imaging Techniques, with Stein Sture, CP Apr. 99, p103-109

Arditi, David
Comparison of Case-Based Reasoning and Artificial Neural Networks, with Onur Behzat Tokdemir, CP July 99, p162-169

Balakrishnan, Mahesh
see Papanicolaou, Athanasios N., CP Apr. 99, p71-79

Bosscher, Peter J.
see Guler, Murat, CP Apr. 99, p116-122

Brzezicki, Jerzy M.
Automatic Image Analysis in Evaluation of Aggregate Shape, with Janusz Kasperkiewicz, CP Apr. 99, p123-128

Burns, S. E.
Digital Image Analysis to Assess Microbubble Behavior in Porous Media, with M. Zhang, CP Jan. 99, p43-48

Chaitavatputtiporn, Tavatchai
see Sawhney, Anil, CP July 99, p178-186

Chen, An-Ting
see Leu, Sou-Sen, CP July 99, p207-216

Chen, Jim-Rong
see Cheng, H. D., CP Oct. 99, p270-280

Cheng, H. D.
Novel Approach to Pavement Cracking Detection Based on Fuzzy Set Theory, with Jim-Rong Chen, Chris Glazier and Y. G. Hu, CP Oct. 99, p270-280

Chinowsky, Paul S.
Benchmarking the World Wide Web in Student Collaboration, CP Oct. 99, p254-260

Clément, Denis E.
see Lottaz, Claudio, CP Jan. 99, p23-35

Cox, Robert F.
see Issa, Raja R. A., CP Oct. 99, p281-290

Dancey, Clinton L.
see Papanicolaou, Athanasios N., CP Apr. 99, p71-79

Davidson, J. W.
Evolution Program for Layout Geometry of Rectilinear Looped Networks, CP Oct. 99, p246-253

Diplas, Panayiotis
see Papanicolaou, Athanasios N., CP Apr. 99, p71-79

Edil, Tuncer B.
see Guler, Murat, CP Apr. 99, p116-122

Elbeltagi, Emad
see Hegazy, Tarek, CP July 99, p198-206

Facchini, M.
see Jacquot, P., CP Apr. 99, p61-70

Fahmy, Hussam
see Tawfik, Maha, CP July 97, p206-211

Faltings, Boi V.
see Lottaz, Claudio, CP Jan. 99, p23-35

Frost, J. David
Imaging Technologies: New Tools for Civil Engineers, CP Apr. 99, p59-60

Fruchter, Renate
A/E/C Teamwork: A Collaborative Design and Learning Space, CP Oct. 99, p261-269

Fu, Chung C.
disc. (of Sequence-Based Prediction in Conceptual Design of Bridges, by Weiyuan Wang and John S. Gero, CP Jan. 97, p37-43), CP Jan. 99, p54

Gangopadhyay, Subhrendu
Subsurface Characterization Using Artificial Neural Network and GIS, with Tirtha Raj Gautam and Ashim Das Gupta, CP July 99, p153-161

Gautam, Tirtha Raj
see Gangopadhyay, Subhrendu, CP July 99, p153-161

Gero, John S.
see Wang, Weiyuan, CP Jan. 97, p37-43

Ghalib, Ali M.
Soil Particle Size Distribution by Mosaic Imaging and Watershed Analysis, with Roman D. Hryciw, CP Apr. 99, p80-87

Gibson, G. Edward, Jr.
see Jung, Youngsoo, CP Oct. 99, p217-225

Glazier, Chris
see Cheng, H. D., CP Oct. 99, p270-280

Guler, Murat
Measurement of Particle Movement in Granular Soils Using Image Analysis, with Tuncer B. Edil and Peter J. Bosscher, CP Apr. 99, p116-122

Gupta, Ashim Das
see Gangopadhyay, Subhrendu, CP July 99, p153-161

Han, Charles S.
Building Design Services in a Distributed Architecture, with John C. Kunz and Kincho H. Law, CP Jan. 99, p12-22

Harman, T.
see Masad, E., CP Apr. 99, p88-95

Heaney, James P.
see Lippai, Istvan, CP July 99, p135-143

Hegazy, Tarek
EvoSite: Evolution-Based Model for Site Layout Planning, with Emad Elbeltagi, CP July 99, p198-206

Heggen, Richard J.
disc. (of Hysteresis Sensitive Neural Network for Modeling Rating Curves, by Maha Tawfik, Ayman Ibrahim and Hussam Fahmy, CP July 97, p206-211), CP Jan. 99, p56-57

Ho, Carlton L.
see Miles, Scott B., CP July 99, p144-152

Hoiroyd, Edmond W., III
Algorithm for Estimating Length of Bent Objects, CP Apr. 99, p130-134

Hryciw, Roman D.
see Ghalib, Ali M., CP Apr. 99, p80-87

Hu, Y. G.
see Cheng, H. D., CP Oct. 99, p270-280

Hung, Shih-Lin
MS_CMAC Neural Network Learning Model in Structural Engineering, with J. C. Jan, CP Jan. 99, p1-11

Hussein, Karim M.
Frameworks for Interaction Support in Distributed Learning Environments, with Feniosky Peña-Mora, CP Oct. 99, p291-302

Ibrahim, Ayman
see Tawfik, Maha, CP July 97, p206-211

Issa, Raja R. A.
Impact of Multimedia-Based Instruction on Learning and Retention, with Cox, Robert F. and Clifford F. Killingsworth, CP Oct. 99, p281-290

Jacquot, P.
Interferometric Imaging: Involvement in Civil Engineering, with M. Facchini, CP Apr. 99, p61-70

Jan, J. C.
see Hung, Shih-Lin, CP Jan. 99, p1-11

Jung, Youngsoo
Planning for Computer Integrated Construction, with G. Edward Gibson, Jr., CP Oct. 99, p217-225

Kasperkiewicz, Janusz
see Brzezicki, Jerzy M., CP Apr. 99, p123-128

Killingsworth, Clifford F.
see Issa, Raja R. A., CP Oct. 99, p281-290

Kumar, B.
see Mathew, A., CP July 99, p170-177

Kunz, John C.
see Han, Charles S., CP Jan. 99, p12-22

Laguna, Manuel
see Lippai, Istvan, CP July 99, p135-143

Lange, D. A., P.E.
see Werner, A. M., CP Apr. 99, p110-115

Law, Kincho H.
see Han, Charles S., CP Jan. 99, p12-22

Leu, Sou-Sen
Fuzzy Optimal Model for Resource-Constrained Construction Scheduling, with An-Ting Chen and Chung-Huei Yang, CP July 99, p207-216

Lippai, Istvan
Robust Water System Design with Commercial Intelligent Search Optimizers, with James P. Heaney and Manuel Laguna, CP July 99, p135-143

Lottaz, Claudio
Constraint-Based Support for Collaboration in Design and Construction, with Denis E. Clément, Boi V. Faltings and Ian F. C. Smith, CP Jan. 99, p23-35

Masad, E.
Internal Structure Characterization of Asphalt Concrete Using Image Analysis, with B. Muhunthan, N. Shashidhar and T. Harman, CP Apr. 99, p88-95

Mathew, A.
Analysis of Masonry Panel under Biaxial Bending Using ANNs and CBR, with B. Kumar, B. P. Sinha and R. F. Pedreschi, CP July 99, p170-177

Mau, S. T.
Design and Implementation of Versatile Beam Analyzer, with X. Tao, CP Jan. 99, p50-52

Miles, Scott B.
Applications and Issues of GIS as Tool for Civil Engineering Modeling, with Carlton L. Ho, CP July 99, p144-152

Moo-Young, Horace
see Pervizpour, Mesut, CP Apr. 99, p96-102

Mtenga, Primus V., P.E.
see Spainhour, Lisa K., CP July 99, p187-197

Muhunthan, B.
see Masad, E., CP Apr. 99, p88-95

Pamukcu, Sibel
see Pervizpour, Mesut, CP Apr. 99, p96-102

Papanicolaou, Athanasios N.
Computer Vision Technique for Tracking Bed Load Movement, with Panayiotis Diplas, Mahesh Balakrishnan and Clinton L. Dancey, CP Apr. 99, p71-79

Pedreschi, R. F.
see Mathew, A., CP July 99, p170-177

Peña-Mora, Feniosky
Information Technology Planning Framework for Large-Scale Projects, with Sanjeev Vadhavkar, Eric Perkins and Thomas Weber, CP Oct. 99, p226-237
see Hussein, Karim M., CP Oct. 99, p291-302

Perkins, Eric
see Peña-Mora, Feniosky, CP Oct. 99, p226-237

Pervizpour, Mesut
Magnetic Resonance Imaging of Hydrocarbon-Contaminated Porous Media, with Sibel Pamukcu and Horace Moo-Young, CP Apr. 99, p96-102

Reich, Yoram
disc. (of Sequence-Based Prediction in Conceptual Design of Bridges, by Weiyuan Wang and John S. Gero, CP Jan. 97, p37-43), CP Jan. 99, p54-55

Sawhney, Anil
Modeling and Analysis of a Concrete Production Plant Using Petri Nets, with Osama Abudayyeh and Tavatchai Chaitavatputtiporn, CP July 99, p178-186

Scherer, William T.
see Smith, Brian L., CP Oct. 99, p238-245

Shashidhar, N.
see Masad, E., CP Apr. 99, p88-95

Sinha, B. P.
see Mathew, A., CP July 99, p170-177

Smith, Brian L.
Developing Complex Integrated Computer Applications and Systems, with William T. Scherer, CP Oct. 99, p238-245

Smith, Ian F. C.
see Lottaz, Claudio, CP Jan. 99, p23-35

Sobanjo, John, P.E.
see Spainhour, Lisa K., CP July 99, p187-197

Spainhour, Lisa K.
Multicriteria DSS with Historical Database for Attenuator Selection, with Primus V. Mtenga, P.E. and John Sobanjo, P.E., CP July 99, p187-197

Sture, Stein
see Alshibli, Khalid A., CP Apr. 99, p103-109

Tao, X.
see Mau, S. T., CP Jan. 99, p50-52

Tawfik, Maha
Hysteresis Sensitive Neural Network for Modeling Rating Curves, with Ayman Ibrahim and Hussam Fahmy, CP July 97, p206-211
disc: Richard J. Heggen, CP Jan. 99, p56-57

Tokdemir, Onur Behzat
see Arditi, David, CP July 99, p162-169

Vadhavkar, Sanjeev
see Peña-Mora, Feniosky, CP Oct. 99, p226-237

Wang, Weiyuan
Sequence-Based Prediction in Conceptual Design of Bridges, with John S. Gero, CP Jan. 97, p37-43
disc: Chung C. Fu, CP Jan. 99, p54
disc: Yoram Reich, CP Jan. 99, p54-55
clo: CP Jan. 99, p55-56

Weber, Thomas
see Peña-Mora, Feniosky, CP Oct. 99, p226-237

Werner, A. M.
Quantitative Image Analysis of Masonry Mortar Microstructure, with D. A. Lange, P.E., CP Apr. 99, p110-115

Yang, Chung-Huei
see Leu, Sou-Sen, CP July 99, p207-216

Yeh, I-Cheng
Design of High-Performance Concrete Mixture Using Neural Networks and Nonlinear Programming, CP Jan. 99, p36-42

Zhang, M.
see Burns, S. E., CP Jan. 99, p43-48